Assessment And Management Of Self-Injurious Behavior (SIB) In The Adult Person With Mental Retardation And Developmental Disabilities (MR/DD)

1. Overview

Self-injurious behavior occurs in three common situations: 1) behavioral complication of mental retardation, 2) as a symptom of Cluster B personality disorders, and 3) suicidality involved with depression **(1), (2).** The clinician must mange this symptom according to the clinical situation of the person with SIB using a biomedical psychosocial approach. Some patients may exhibit all criteria (a mildly mentally retarded, depressed person with borderline personality disorder). The number of comorbidities increases the difficulty of achieving therapeutic success. Personality disorders are common in persons with MR/DD and these features may be present in up to 22% of patients.

2. Neurobiology of SIB

The neurobiology of SIB is undetermined although serotonergic systems have been implicated in producing these symptoms **(3).** Animal models do not exist for SIB that model human self-injurious behaviors. Suicide, the ultimate SIB, occurs in persons with diminished serotonergic markers in the neocortex **(3), (4).** Functional and structural brain imaging studies fail to document specific lesions that produce SIB. This syndrome is not produced by specific etiologies for mental retardation but rather is a behavioral manifestation of the reduced intellectual capacity **(5).**

3. SIB in Persons with Intellectual Disability

3.1. Incidence. Self-injurious behavior is not a common problem in persons with mental retardation; however, these symptoms can produce serious patient injury and family distress **(2), (6), (7).** Among persons with challenging behaviors, one-fourth will have SIB (28%). Multiple scars or injuries of extremities, cauliflower ear from striking the head, facial injury and other wounds are evidence of old SIB **(See Table 1**). SIB occurs most often in moderate to severely retarded persons with a history of SIB. The appearance of SIB in mildly retarded persons suggests symptoms produced by personality disorder or substance abuse including stimulants, methamphetamine, hallucinogens and others **(See Table 2).**

Table 1
Common Types of SIB in Persons with Moderate to Severe MR

1. Head, face or body slapping
2. Extremity biters or chewers
3. Body punchers
4. Body or head pinchers
5. Rectal diggers
6. Orifices gougers

3.2. Etiology. The causes of SIB include behavioral, psychiatric, and medical. The behavioral aspects of SIB in persons with moderate or severe mental retardation are divided into three broad categories: 1) self-stimulation, 2) stress avoidance, and 3) learned behavior. Regardless of the psychological/behavioral antecedents of SIB, the clinician must exclude medical, psychiatric, and neurological problems as potential causes or promoters of this behavior. All MR/DD people with SIB should have a meticulous evaluation by a psychiatrist and a behavioral specialist to assess behavioral causes of the symptoms. The medical model should be used in conjunction with the behavioral approach **(See Table 2).**

Table 2
Differential Diagnosis of SIB Based on Severity of MR/DD

IQ Range	Common Causes to Exclude
Borderline/Mild	• B Cluster Personality Disorder • Major mental illness, such as depression, mania, GAD • Substance abuse such as methamphetamine • Adverse drug reaction • Suicidality • Manipulative behavior or malingering • Factitious disorder
Moderate/Severe	• Seizure disorders • Medical problem producing pain • Major mental illness • Learned behavior • Environmental stressors • Adverse drug reaction

New onset SIB, reoccurrence of previous SIB or dramatic increased symptoms of SIB requires a detailed medical, psychiatric, and neurological evaluation **(8), (9), (10)**. Common medical causes of SIB include pain, seizures, delirium, GI distress, bowel irregularity, menstrual pain or other medical problems. Age-dependent medical problems can produce SIB, including angina, nerve route pain, peripheral neuropathy, degenerative joint disease, premenstrual syndrome, irritable bowel, sinusitis, allergies, menopause, and others. Therapy for minor medical problems, (e.g., antihistamines) can worsen confusion and behavioral abnormalities. Medication side effects such as muscle cramps from statin therapy, GI distress from anti-inflammatories, or akathisia

can produce or worsen SIB. Pain produced by ear infections, sinus infections, dental disease, headaches, (e.g., migraine, eye pain, glaucoma), can produce self-injurious behavior that targets the head, face, and neck. Pain elsewhere in the body such as colonic distention, peptic ulcer disease, angina, degenerative joint disease, etc., may provoke or promote SIB of all types. Any patient with SIB requires a careful, complete medical evaluation. Face or mouth slappers require a dental exam. Eye pickers or gougers require a visit to the ophthalmologist **(See Table 3).**

Table 3
Head/Face Slapping Behavior

- Complete physical and neurological exam
- Sinus Films
- Dental Exam
- Ophthalmology consult if targeting eyes

3.3. Clinical Evaluation

a. Medical assessment. The clinical assessment of SIB requires input from caregivers and a complete medical evaluation. The frequency, intensity, and targeting of SIB provides helpful clues to etiology. Head banging may result from headaches, sinus infections, foreign bodies in orifices, toothaches or hallucinations. Gouging at bodily orifices suggests pain in that region, (e.g., rectal digging produced by hemorrhoids or impaction). Paroxysmal SIB may result from angina, muscle spasm, irritable bowel, gluten allergy or some other paroxysmal pain **(See Table 2).**

New onset of SIB requires a medical evaluation that includes vital signs, physical examination, and basic laboratory assessments that may include blood count, medication levels, and urinalysis. Women of childbearing age need a careful review of menstrual history and pregnancy testing. All patients require a complete, basic physical examination to exclude unrecognized new health problems **(8), (9).**

The person's inability to communicate and non-compliance with medical interventions complicate the clinical assessment of patients with SIB and moderate to severe retardation. Because some individuals with intellectual disabilities cannot report symptoms, common health conditions can evolve into serious medical problems that produce significant distress and behavioral abnormalities. Dental abscesses, rectal impaction, sinusitis, etc., can develop in mentally retarded persons because the patient is unable to report early symptoms to clinicians. The patient's skin should be examined while disrobed to identify new evidence of trauma **(8).**

After the initial evaluation, chronic, persistent SIB requires medical re-evaluation when the frequency or intensity of the symptoms changes. Patients with chronic SIB should undergo periodic medical evaluation, (i.e., at least yearly) to exclude other new treatable causes that may promote this behavior.

b. Neurological Examination. Neurological problems can provoke SIB. Seizures can produce auras or post-ictal confusion that worsens SIB **(11).** Migraines, headaches, trigeminal neuralgia and other sources of neurological pain can provoke these symptoms. Careful assessment is required to identify these precipitants. Chronic back disease, disc disease, or neuropathic pain from diseases, such as diabetes, will produce distress and anxiety that manifests as SIB. A basic neurological examination is required to exclude new focal deficits. Unexplained, episodic injuries may result from unrecognized seizures.

c. Psychiatric Problems. Psychiatric problems can produce or worsen SIB. Depression **(12)**, mania **(13),** distressing hallucinations, generalized anxiety, and other symptoms of anxiety disorders can exacerbate SIB. SIB can be a response to physical or sexual abuse that produces post-traumatic stress disorder in moderately retarded individuals **(14).** Patients with mild MR may have substance abuse problems, factitious disorders or personality disorders.

d. Adverse Drug Reaction. Some medications can produce side effects that may precipitate or worsen SIB. Antipsychotics and SSRI's can produce akathisia. Benzodiazepines can produce delirium. An evaluation of SIB warrants an assessment of medications that may produce psychiatric complications, such as steroids, stimulants and others **(8).**

e. Behavioral Measures of Psychiatric Symptoms. Once there is reasonable certainty that there are no medical explanations for the self-injurious behaviors, an assessment of psychiatric symptoms should be conducted. Individuals with intellectual disabilities are more likely to have behavioral manifestations of psychiatric symptoms when they occur and are less likely to be able to verbalize in a sophisticated way about what they are experiencing. Some assessment tools designed for aiding the identification of psychiatric symptoms in individuals with intellectual disabilities include the DASH-II (Diagnostic Assessment for the Severely Handicapped – II), the ADD (Assessment of Dual Diagnosis), and the REISS Screen. These instruments have taken symptoms for the various diagnostic categories in the DSM and translated them into descriptions of behaviors that have been associated with particular diagnostic categories. This kind of assessment can also help sort out which behaviors are manifestations of a psychiatric disorder and which behaviors are a result of learning. Functional behavioral assessments need to be conducted for the latter when identified.

3.4. Treatment

The treatment of acute, severe SIB may require sedation until the behavior is controlled and evaluated. Injectable antipsychotics can be used to sedate the patient **(See Table 4).**

Table 4
Common Dosing Ranges of Injectable Medications for Acute, Severe SIB in the Adult MR/DD Patient Produced
(Dosing Range in Milligrams)

MEDICATION	FRAIL or OLD (mg)	HEALTHY or YOUNG (mg)	CAUTION See PDR
Haldol (haloperidol)[1]	0.5 to 2.5	1 to 5	Acute EPS
Zyprexa (olanzapine)[2]	2.5 to 5	2.5 to 10	Hypotension
Geodon (ziprasidone)[3]	5 to 10	10 to 20	Cardiac Toxicity

[1] May give Haldol every two hours for a total of four doses in 24 hours. [2] May give a total of three doses of Zyprexa per 24 hours. Second dose may follow first dose by 2 hours and the third dose may be administered four hours after the second. [3] May repeat Geodon once in 2 to 4 hours for a total of two doses in 24 hours.

These values are suggested dosing ranges. Each patient should be individually assessed and dosing adjusted to that individual's clinical circumstances. Consult a child psychiatrist for treatment of children and adolescents. See PDR for complete information.

a. Pharmacological Management. The treatment of SIB combines behavioral management strategies with treatment of potential underlying health problems. Empirical uses of medications, such as non-narcotic analgesics, are appropriate when confirmed medical conditions exist that may improve with safe, effective treatment **(15).** For instance, a non-communicative patient with degenerative joint disease may respond to Tylenol or a non-steroidal anti-inflammatory medication. Antipsychotics and antidepressants can be used when empirical data suggest the possibility of psychosis or depression **(16), (17), (18).** Benzodiazepines should be used with great caution because they have the potential for significant delirium.

The consensus therapeutic guidelines suggest anticonvulsants and second generation antipsychotics as first line medications in persistent SIB that may harm the patient (**See Table 5), (18).** Antipsychotic medications can be used when anticonvulsant medications, such as valproic acid and carbamazepine, are not effective in therapeutic doses **(See Table 5).** The probable mechanism of action for beneficial effect of antiepileptic medications is reduction of impulsive behavior.

Table 5
Consensus Criteria Medications for Pharmacological Management of Severe Self-Injurious Behavior (18)

1. Second Generation Antipsychotic Medications
2. Anticonvulsants – Valproic acid
3. Antidepressants - SSRIs

Valproic acid or carbamazepine can be prescribed to reduce the frequency of SIB. Doses should be adjusted to the lowest level capable of suppressing symptoms. Carbamazepine and Lithium can also produce symptom reduction. Dosing should not exceed that required to achieve full therapeutic blood level **(See Table 6).**

Table 6
Commonly Prescribed Doses of Anticonvulsant Mood Stabilizing Agents for Adults with Mental Retardation and Developmental Disabilities and Self-Injurious Behavior (18), (19)

Medication Choices	Daily Dose for Healthy/Young		Daily Dose for Frail/Elderly		Comments See PDR
	Dose (mg)	*Target Blood Level*	*Dose (mg)*	*Target Blood Level*	
Valproic Acid	900 to 2400mg	50 to 125 mcg/ml	750 to 1500mg	50 to 100 mcg/ml	Hepato Toxicity Low Platelets
Carbamazepine	400 to 1200mg	4 to 10 mcg/ml	200 to 800mg	2 to 8 mcg/ml	Neutropenia Hyponatremia
Lithium	300 to 1200mg	0.5 to 1.5mEq/L	150 to 600mg	0.2 to 1.0 mEq/L	Multiple Drug Interactions Narrow Therapeutic Window
Dose ranges are commonly prescribed for mood stabilization or anti-impulsive effect. All doses must be individually adjusted for the individual patient. Consult with a child psychiatrist for treatment of children or adolescents. Consult with PDR for complete information.					

Second and third generation antipsychotics can be prescribed to reduce SIB. No medication is proven superior although risperidone has the most data on symptom reduction. Clozapine is not indicated for SIB **(See Table 7).**

Table 7
Summary of Common Doses of Antipsychotic Medications Prescribed for the Adult Person with MR/DD Who Manifests SIB (20), (21)

Drug	Healthy/Adult Daily Dose Range	Frail or Elderly Daily Dose Range	Major Advisory See PDR for Complete Details
2nd Generation Medications			
Risperidone	1-6mg	0.25-2.0mg	Dose-related EPS
Olanzapine	5-20mg	2.5-10mg	Sedation and Metabolic Issues
Quetiapine	25-800mg	25-200mg	Sedation and Hypotension Possible
Ziprasidone	20-160mg	20-80mg	Cardiac Warning
3rd Generation Medications			
Aripiprazole	5-30mg	5-20mg	Akathesia and/or withdrawal Dyskinesia Possible
ABBREVIATIONS: EPS – Extrapyramidal Symptoms TD- Tardive Dyskinesia These values summarize typical dose ranges used for persons with MR/DD. Each patient should be carefully assessed and dosing adjusted to his or her clinical circumstances. See PDR for a complete description of possible side effects.			

Sedating medications rarely prevent or diminish SIB. First generation antipsychotic medications, benzodiazepines, and other sedatives should not be used for chronic

treatment of SIB unless specific psychiatric diagnoses are identified. The treatment team should rely on behavioral interventions in the management of this distressing syndrome except in cases where there is medical or psychiatric causes and cases where the behavior is a threat to the patient's safety. The use of antipsychotic or benzodiazepine medications will alter behaviors by short-term sedation rather than correction of the underlying problem.

Second and third generation antidepressants are effective in reducing the frequency of SIB in some patients with MR/DD. These medications are a third choice except for persons with a past history of depression, anxiety or obsessive-compulsive disorder **(See Table 8).**

Table 8
Common Dose Ranges for the Prescription of Antidepressant Medications for the Adult Population with MR/DD and SIB (20), (21)

Medication Class	Healthy/Adult Daily Dose Range	Frail/Elderly Daily Dose Range	Comments (See PDR for full description)
2nd Generation (SSRI's)			
Fluoxetine	10-80mg	5-40mg	Generic Available. May be Activating
Paroxetine	10-60mg	5-30mg	Generic Available. Anticholinergic
Sertraline	50-200mg	25-200mg	GI Side Effects. Take With Food
Citalopram	20-60mg	10-20mg	Few Significant Drug Interactions
Escitalopram	10-30mg	5-20mg	Few Significant Drug Interactions
This table contains common dose ranges of antidepressant medications that are commonly prescribed for persons with MR/DD. Each patient requires an individualized prescription based on medical and psychiatric features. This information is not a prescriptive guidance. Consult a child psychiatrist for pharmacotherapy in children and adolescents.			

b. Behavioral Management. Behavior analytic procedures can be included with other treatment modalities for a person who has self-injurious behavior and intellectual disabilities. Behavioral specialists can determine appropriate training strategies to assist a person with intellectual disabilities to gain better coping skills for dealing with their behavioral symptoms. Triggers for the symptoms can be identified and strategies taught to staff, family members, and the individual to prevent escalation of the behavioral symptom. Counseling can be provided, keeping in mind that discussions need to be geared toward the level of understanding of the individual. Most counseling should take the form of skill-building and include the chance for positive reinforcement during the learning process along with arranging an enriched environment. For example, if an individual becomes angry easily due to an impulse control problem, anger management training may be successful when presented in

simplistic terms, modeled by the clinician, and practiced repeatedly by the individual in more than one or two sessions. As the person learns the management techniques, positive reinforcement should be delivered to assist with the acquisition and maintenance of the skills **(22).**

3.5. Assessing Clinical Outcomes

The therapeutic endpoint is reduction of symptoms as described by the patient and caregiver or as measured by behavioral monitoring. Mildly retarded patients can describe symptoms. The clinician must depend on behavioral symptoms to determine efficacy in severely retarded persons. Minimal behavioral monitoring requires consistent measurements over a minimum of several days of observation **(See Table - 9).**

Table 9
Methods of Assessing Therapeutic Benefit of Pharmacological Management of SIB

Severity of Mental Retardation	Self-Reporting	Caregiver Reporting	Behavioral Monitoring
Mild	R	R	H
Moderate	H	R	R
Severe/Profound	U	R	R

R=Required **H**=Helpful, but not always required **U**=Unreliable

4. Suicidality in Persons with Mental Retardation

Suicidality is a form of SIB that occurs in depression and Cluster B personality disorders. The clinician must determine whether the threat is an attention-seeking behavior or whether the patient has genuine intent to engage in self-harm. Suicidality is seen in depression, mania, schizophrenia, substance abuse, and generalized anxiety disorders **(4).** The management of suicidality is treatment of underlying psychiatric disease or psychopathology. Suicidality is most likely in persons with mild or moderate MR. Patients with mild MR/DD who describe new-onset suicidal ideas or intent require immediate evaluation and consideration of psychiatric hospitalization to assess the level of risk and treat underlying causes of suicidality. Some patients may make statements such as "I'm going to kill myself" as a response to frustration or anger. Each situation requires individual evaluation.

5. SIB in Persons with Personality Disorders

The Cluster-B personality disorders, including borderline narcissistic and antisocial, are associated with self-injurious behavior **(4).** Self-mutilation or impulsive self-injury is common in persons with borderline personality and to a lesser extent, those with antisocial personality disorders. The person with borderline personality may self-mutilate to self-stimulate, while the person with antisocial personality disorder often self-injures to manipulate their circumstances, (e.g., get out of jail), **See Table 2.** The

presence of self-injurious behavior in persons with mental retardation does not suggest a personality disorder but rather a specific behavioral abnormality. Persons with mild mental retardation have sufficient intellectual development to warrant the diagnosis of personality disorder; however, those with moderate to severe mental retardation are unlikely to have sufficient intellectual development to develop these syndromes. Clinicians should avoid the diagnosis of personality disorders in persons with mental retardation because this diagnosis implies a certain degree of volition and control that is rarely present in persons with moderate to severe mental retardation. The types of complex, psychological and interpersonal processes that produce personality disorders are rarely operational in persons with moderate to severe mental retardation. Mood stabilizers and antidepressant medications may improve SIB in persons with Cluster-B personality disorders; however, these patients require long-term psychotherapy to correct internal psychological problems producing the symptoms.

6. SIB in Persons with Substance Abuse

The rate of substance abuse in young persons with mild MR/DD probably equals the rate in young persons with normal intellect **(See Table 2).** Methamphetamine, cocaine, and hallucinogen abuse can produce psychosis, mood disorders, and SIB. Amphetamine abuse can cause skin-picking and serious excoriations. Patients with mild MR/DD and SIB should undergo drug screening and assessment for possible substance abuse.

7. Conclusion

SIB is a complex disorder. SIB is usually a symptom of some other problem rather than a primary disorder. The evaluation and differential diagnosis depends on severity of mental retardation. Treatment should focus on removing the underlying cause(s).

REFERENCES

1. Bouras N, Drummond C. Behavior and psychiatric disorders of people with mental handicaps living in the community. Journal of Intellectual Disability Research 1992;36:349-357.

2. Rojahn J. Self-injurious and stereotypic behavior of non-institutionalized mentally retarded people: prevalence and classification. American Journal of Mental Defic. 1986;91(3):268-276.

3. Aman MG, Arnold LE, Armstrong SC. Review of serotonergic agents and perseverative behavior in patients with developmental disabilities. Ment. Retard. and Devel. Dis. Research Reviews 1999;5:279-289.

4. Kaplan HI, Sadock BJ, eds. Comprehensive Textbook of Psychiatry/V, Baltimore: Williams & Wilkins, 1989.

5. Moldavsky M, Lev D, Lerman-Sagie T. Behavioral phenotypes of genetic syndromes: a reference guide for psychiatrists. J. Am. Acad. Child. Adolesc. Psych 2001;40(7):749-761.

6. Deb S, Thomas M, Bright C. Mental disorder in adults with intellectual disability. I: Prevalence of functional psychiatric illness among a community-based population aged between 16 and 64 years. Journal of Intellectual Disability Research 2001;45(6):495-505.

7. Fraser WI, Leudar I, Gray J, Campbell I. Psychiatric and behavior disturbance in mental handicap. J. Ment. Defic. Res. 1986;30:49-57.

8. Kastner T, Walsh KK, Fraser M. Undiagnosed medical conditions and medication side effects presenting as behavioral/psychiatric problems in people with mental retardation. Mental Health Aspects of Developmental Disabilities, July/August/September 2001;4(3):101-107.

9. Ryan R, Sunada K. Medical evaluation of persons with mental retardation referred for psychiatric assessment. General Hospital Psychiatry 1997;19:274-280.

10. Silka VR, Hauser MJ. Psychiatric assessment of the person with mental retardation. Psychiatric Annals 1997;27(3):162-169.

11. Nakken KO, Lossius R. Seizure-related injuries in multi-handicapped patients with therapy-resistant epilepsy. Epilepsia 1993;34(5):836-840.

12. Meins W. Symptoms of major depression in mentally retarded adults. Journal of Intellectual Disability Research 1995;39(1):41-45.

13. Lowry MA, Sovner R. Severe behavior problems associated with rapid cycling bipolar disorder in two adults with profound mental retardation. Journal of Intellectual Disability Research 1992;36:269-281.

14. Khreim I, Mikkelsen E. Anxiety disorders in adults with mental retardation. Psych. Annals 1997;27(3):175-181.

15. Farber JM. Psychopharmacology of self-injurious behavior in the mentally retarded. J. Amer. Acad. Child Adol. Psychiatry 1987;26(3):296-302.

16. Osman OT, Loschen EL. Self-injurious behavior in the developmentally disabled: pharmacologic treatment. Psychopharmacol. Bull. 1992;28:439-449.

17. Reiss S, Aman MG. The international consensus process on psychopharmacology and intellectual disability. Journal of Intellectual Disability Research 1997; 41(6):448-455.

18. Special Issue. Expert Consensus Guidelines Series: Treatment of psychiatric and behavioral problems in mental retardation. American Journal on Mental Retardation 2000;105(3):165-188.

19. Beange H, McElduff A, Baker W. Medical disorders of adults with mental retardation: a population study. American Journal on Mental Retardation 1995;99(6):595-604.

20. Tasman A, Kay J, Lieberman JA (Eds.)., (2003). *Psychiatry therapeutics* (2nd Edition). London: Wiley.

21. Physician's Desk Reference (PDR), (58th Edition). Montvale, NJ: Thompson PDR, 2004.

22. Dubard M, Roberts DS, Sterling-Turner HE. The influence of therapist attention on self-injury during a tangible condition. Journal of Applied Behavior Analysis 2002;35:283-286.